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SUD-CHEMIE INC. 1600 WEST HILL STREET LOUISVILLE, KY 40210			JOHNSON, CHRISTINA ANN	
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1725

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/758,552  
Filing Date: January 15, 2004  
Appellant(s): WAGNER ET AL.

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Joan L. Simunic  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed December 30, 2005 appealing from the  
Office action mailed June 3, 2005.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

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**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

WO 00/54879	MATSUSHITA ELECTRIC WORKS, LTD.	09-2000
US 6,455,182	SILVER	09-2002
WO 00/66486	ARTHUR D. LITTLE, INC.	11-2000
EP 1 161 991 (English language equivalent of WO '879)	MATSUSHITA ELECTRIC WORKS, LTD.	12-2001

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-8, 11-13, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 00/54879 in view of Silver.

WO 00/54879 (Note that EP 1 161 991 is an English language equivalent) discloses a catalyst composition useful in water gas shift reactions for converting carbon monoxide and water into carbon dioxide and hydrogen (page 1, lines 5-10 and 25-30).

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The catalyst composition comprises platinum supported on a metal oxide carrier such as zirconia (page 2, line 25 – page 3, line 5). Platinum is supported in an amount in the range of 0.1-10% by weight (page 3, lines 5-8). It is taught that rhenium is supported as another active component in an amount in the range of 0.1-10% by weight (page 3, lines 5-10). In an example, a catalyst is prepared having 3% by weight Pt and 1% by weight Re, which yields a Pt/Re ratio of 3:1 (page 14, Table 3). It is further taught that the catalyst may further contain an additional metal promoter such as cerium (page 3, lines 10-18).

The WO reference teaches that the catalyst is prepared by combining the metal oxide support with aqueous salt solutions of the active metals, followed by evaporation to dryness and calcination at a temperature in the range of 400-600 degrees C (page 3, lines 18- page 4, line 20). The use of chloroplatinic acid hexahydrate and ammonium perrhenate are exemplified as the platinum and rhenium salt solutions (Examples 1-5 and Table 2).

The difference between the reference and the claims is that the reference does not disclose the use of a support comprising cerium oxide, specifically a support comprising cerium oxide and an additive material such as zirconium dioxide.

Silver (US 6,455,182) discloses a catalyst composition useful in the catalyzing the water-gas shift reaction, converting carbon monoxide to hydrogen (column 1, lines 35-60). The catalyst composition comprises a noble metal catalyst having a promoted support, comprising a mixed oxide of at least cerium oxide and zirconium oxide (column 2, lines 55-61). Silver teaches that while cerium promoted noble metal catalysts have

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been shown to be effective for promoting the water gas shift reaction, they do not sufficient activity for the shift reaction without the use of a unreasonable large reactor bed (column 2, lines 15-25). Silver teaches that, through the combination of cerium and zirconia in the support material, the activity of the composition is increased and the stability of the catalyst is improved (column 2, lines 61-66). It is taught that the zirconia is present in the range of about 50-30 mole% and the ceria is present in the range of 50-70 mole % (column 4, lines 40-45). The support may further contain an additive metal such as Pr or La, in an amount in the range of 0-10 mole % (column 3, lines 1-5 and column 4, lines 44-46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the catalyst taught by the WO reference to include the use of a mixed cerium oxide – zirconium oxide support as taught by Silver. The WO reference teaches a catalyst composition comprising Pt and Re supported on zirconia and further suggests an additional promoter such as cerium. The teachings of Silver would motivate one of ordinary skill to substitute the zirconia carrier with the mixed cerium oxide-zirconium oxide carrier in order to realize the advantages disclosed therein, i.e. higher activity and stability. Because both catalysts can be used in the same process, one would have reasonable expectation of success from the combination.

The process limitations in claim 13 is noted. However, when the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to applicant to establish that their product is patentably distinct and not the

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examiner to show the same process of making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324.

Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 00/54879 in view of Silver as applied to claims 1-8, 11-13, and 19-20 above, and further in view of WO 00/66486.

The teachings of WO 00/54879 as modified by Silver are applied as described above for claims 1-8, 11-13, and 19-20.

The modified disclosure of WO 00/54879 further does not teach that the primary transition metal is provided as a transition metal complex having at least one ligand, where the ligand is absent of sulfur, chlorine, sodium, bromine, and iodine.

WO 00/66486 discloses a catalyst composition useful in the conversion of carbon monoxide and water into carbon dioxide and hydrogen comprising a platinum supported on zirconium oxide (Abstract). The reference teaches that while chloroplatinic acid is an inexpensive source of platinum, tetra amine platinum nitrate (TAPN) is preferred as a source of platinum because TAPN does not introduce chlorine into the catalyst system, which would interfere with the reaction. See pages 11-12.

It would have been obvious to one having ordinary skill in the art to further modify the invention of WO '879 to include the use of TAPN in light of the teachings of WO '486. One of ordinary skill would have been motivated to do so to prevent introducing a contaminant into the catalyst system, as taught by WO '486. Because both catalysts

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can be used in the same reaction, one would have reasonable expectation of success from the combination.

### **(10) Response to Argument**

1. With respect to the rejection of claims 1-7, 8, 11-12 and 19, Appellant argues that there is no suggestion or motivation, in the WO '879 reference or Silver patent to modify the reference or combine reference teachings.

With respect to the primary reference, Appellant argues that because ceria was a known support material for platinum and rhenium water gas shift catalysts, it is reasonable to assume that the omission of ceria from the list of possible metal oxide supports in the WO '879 reference was intentional. This argument has been considered but is not persuasive. First, throughout the entire response, it appears that Appellant is arguing the references individually. However, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Secondly, the only conclusion that one could draw from the omission of ceria from the possible support materials is that the WO '879 reference does not specifically teach the use of ceria as a support material, as discussed in the final office action.

There could be a multitude of reasons why the inventor did not use ceria as a support



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material. This does not mean that the use of ceria would not have been obvious to one having ordinary skill in the art and is not evidence of a teaching away from a ceria support nor an indication of non-obviousness.

Appellant concludes that there is no suggestion or motivation in the WO '879 reference or in the knowledge that was generally available to one of ordinary skill in the art at the time the invention was made to have modified the teachings of the WO '879 reference to include ceria in the support of the water gas shift catalyst. This argument has been considered but is not persuasive. Appellant appears to be ignoring the teachings of the secondary reference to Silver. The examiner would submit that the Silver patent clearly provides motivation to modify the primary reference.

In this case, the WO '879 reference teaches a catalyst composition comprising a combination of metals meeting the instantly claimed ratio supported on a material such as zirconium oxide. Refer to pages 2-3 and page 14, Table 3 of the WO '879 reference. WO '879 further suggests that such a catalyst may be promoted with a cerium oxide promoter. Thus, the WO '879 reference teaches the claimed invention, except for the support material comprising cerium oxide and an additive. The Silver patent teaches that ceria-promoted platinum catalysts are known; however, such catalysts do not have sufficient activity for the water gas shift reaction without the use of an unreasonable large reactor bed. Refer to column 2, lines 15-25 of Silver. Silver solves this problem through the combination of cerium and zirconia in the support material, and further teaches that the activity of the composition is increased and the stability of the catalyst is improved. Refer to column 2, lines 61-66 of Silver. Therefore, there is clear motivation

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to combine the references by modifying the WO '879 reference to include the use of a cerium oxide-zirconium oxide support material. This motivation is found explicitly in the secondary reference and it is this combination which is the basis for the rejection under 35 USC 103. Appellant has not responded to the basis of this rejection.

Appellant further argues the Silver reference separately, arguing that the reference does not teach the claimed ratio of [Primary TM]:[Promoter]. Again, as discussed above, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. Further, this argument does not appear to be relevant to the issues at hand. The WO '879 reference teaches the claimed ratio, as acknowledged by Appellant on page 3 of the Appeal Brief. The claims have been rejected as unpatentable over the WO '879 reference in view of the Silver patent and not vice versa. The difference between the primary reference and the instant claims, is the use of a cerium oxide and additive-containing support material. Silver is not relied upon to teach the claimed ratio as this is met by the primary reference.

Although not relevant to the rejection, Appellant's assertion that the Silver reference is limited to combinations of platinum, palladium, rhodium, and/or gold is not commensurate in scope with the teachings of the reference. The reference clearly teaches that a combination of noble metals can be used and further teaches that the noble metal combination may include rhenium and platinum. Refer to column 6, lines 20-26 of the Silver patent.

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2. With respect to the rejection of claims 1-7, 8, 11-12 and 19, Appellant argues that there is no reasonable expectation of success, except in hindsight in view of the present invention.

Appellant argues that because each of the WO '879 reference and the Silver patent left gaps within their teachings, these gaps must have been deliberate because the inventors of those patents did not believe there was a reasonable expectation of success from making the combination. This argument has been considered but is not persuasive. As discussed above, the only relevant "gap" is the cited difference between the WO '879 reference and the instant claims, i.e. the use of a support material comprising cerium oxide and an additive. This difference is supplied by the secondary reference to Silver which contains the motivation to combine the references, i.e. to arrive at a catalyst which has increased activity and stability. Because both references are concerned with a catalyst material for the same process of use, i.e. a water gas shift process, and both references disclose catalyst compositions containing the same or similar active metal materials, one of ordinary skill would recognize the references as analogous art and would have a reasonable expectation of success from the combination.

In response to Appellant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was

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within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case, the motivation to combine the references comes directly from the secondary reference to Silver.

3. With respect to the rejection of claims 1-7, 8, 11-12 and 19, Appellant argues that neither the WO '879 reference or the Silver patent alone or in combination teach all of the claimed limitations.

Appellant argues that the references, taken alone do not teach all of the claimed limitations. This is correct. However, the rejection has been made under 35 USC 103 and not 35 USC 102. The examiner acknowledges that there is a difference between the claimed invention and teachings of the prior art.

Appellant further argues that the references, taken in combination, do not teach all of the claimed limitations. This argument has been considered but is not persuasive. As discussed above, the WO '879 teaches a catalyst composition comprising a combination of metals meeting the instantly claimed ratio supported on a material such as zirconium oxide. Refer to pages 2-3 and page 14, Table 3 of the WO '879 reference. WO '879 further suggests that such a catalyst may be promoted with a cerium oxide promoter. Thus, the WO reference teaches the claimed invention, except for the support material comprising cerium oxide and an additive. The Silver patent teaches that ceria-

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promoted platinum catalysts are known; however, such catalysts do not have sufficient activity for the water gas shift reaction without the use of an unreasonable large reactor bed. Refer to column 2, lines 15-25 of Silver. Silver solves this problem through the combination of cerium and zirconia in the support material, and further teaches that the activity of the composition is increased and the stability of the catalyst is improved. Refer to column 2, lines 61-66 of Silver. Therefore, there is clear motivation to combine the references which is found explicitly in the secondary reference and it is this combination which is the basis for the rejection under 35 USC 103. Appellant has not responded to the basis of this rejection. Thus all of the limitations of the instant claims are met by the combined teachings of the WO '879 reference and the Silver patent.

4. With respect to the rejection of claims 13-17 and 20, Appellant argues that neither the WO '879 reference or the Silver patent alone or in combination teach the claimed preparation process.

Appellant argues that because it is not possible to get to the claimed transition metal combination plus the support of the instant invention, the catalyst prepared in Claims 13-17 and 20 is novel and non-obvious. This argument has been considered but is not persuasive. For the reasons discussed above, it is the position of the examiner that the WO '879 reference and the Silver patent combine to teach the claimed transition metal combination and support of the instant invention. Moreover, the WO '879 reference teaches specifically that the catalyst is prepared by impregnation of the

support material. Refer to pages 3-4 of the WO '879 reference. Further, WO 00/66486 has been applied in combination with the WO '879 reference and Silver patent to supply specifically the limitations required by claims 14-17.

### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

### **(12) Conclusion**

In conclusion, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

In this case, the WO '879 reference teaches a catalyst composition comprising a combination of metals meeting the instantly claimed ratio supported on a material such as zirconium oxide. Refer to pages 2-3 and page 14, Table 3 of the WO '879 reference.

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WO '879 further suggests that such a catalyst may be promoted with a cerium oxide promoter. Thus, the WO reference teaches the claimed invention, except for the support material comprising cerium oxide and an additive. The Silver patent teaches that ceria-promoted platinum catalysts are known; however, such catalysts do not have sufficient activity for the water gas shift reaction without the use of an unreasonable large reactor bed. Refer to column 2, lines 15-25 of Silver. Silver solves this problem through the combination of cerium and zirconia in the support material, and further teaches that the activity of the composition is increased and the stability of the catalyst is improved. Refer to column 2, lines 61-66 of Silver. Therefore, one of ordinary skill would have been motivated to substitute the support material taught by the WO '879 reference for the support material taught by the Silver patent in light of the advantages taught by Silver. There is clear motivation to combine the references which is found explicitly in the secondary reference.

Because both references are concerned with a catalyst material for the same process of use, i.e. a water gas shift process, and both references disclose catalyst compositions containing the same or similar active metal materials, one of ordinary skill would recognize the references as analogous art and would have a reasonable expectation of success from the combination. The combined teachings of the WO '879 reference and the Silver patent teach all three required features of the claimed invention. Therefore, a *prima facie* case of obviousness has been set forth by the examiner. Appellant has failed to present any evidence of arguments tending to rebut this *prima facie* case of obviousness.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

  
Christina Johnson

Primary Examiner

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1/30/06

Conferees:

Tom Dunn 

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